

## ABSTRACT OF THE DISCLOSURE

A printhead includes a silicon substrate, a first barrier layer, a second barrier layer, and a nozzle plate. The silicon substrate has a plurality of thermal elements and a main ink supply channel, each of the thermal elements being in a firing chamber of the first barrier layer and in fluid communications with the main ink supply channel through ink channels. The top of each ink firing elements is aligned with a nozzle on the nozzle plate. To satisfy the need for high-frequency ink ejection, the second barrier layer is utilized to provide an auxiliary ink supply channel for increasing the ink supply speed. The ink channel between the main ink supply and the ink channel inlet is enlarged in the vertical direction so as to lower the pressure and thus increase the ink supply speed.